COMPLETION AND COMMISSIONING REQUIREMENTS IN THE SEATTLE ENERGY CODE

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OVERVIEW

- C & C requirements took effect in summer 1998 *(along with other Energy Code revisions as part of the regular 3-year code update cycle)*
- Code language on completion & commissioning: *code adoption process, HVAC, lighting, format, Building Official's role, limitations*
- Implementation: *publications, training on Energy Code update, plan review, inspection*
- Lessons learned: *there's always more to do*
- Resources for further information: *website, staff*

CODE LANGUAGE:
Parties in Code Adoption Process

- ASHRAE/IESNA Standard 90.1-1999:
  public review draft basis for code language
- Building Commissioning Association - Pacific Northwest (BCA-NW):
  member of Energy Code Advisory Committee, proposed minor modifications to 90.1 draft
- Mechanical/electrical contractors:
  supported the proposal, stated that they were doing this already, wanted a level playing field

CODE LANGUAGE:
HVAC completion, lighting controls

- 1416.1 Drawings: record drawings in 90 days
- 1416.2 Manuals: operating & maintenance manual
- 1416.3 System Balancing: a written balance report
- 1416.4 HVAC Systems Commissioning:
  Simple systems: report of test procedures & results
  Other systems: preliminary commissioning report
  to be completed prior to certificate of occupancy
- 1513.7 Automatic lighting controls: provide report

CODE LANGUAGE:
Format & Building Official's role

- General format:
  "Construction documents shall require _____ be provided to the building owner".
- Building official's role:
  "The building official should check only to be sure that the construction documents require this information be transmitted to the owner. Copies of these materials transmitted to the owner are not required to be sent to the building official."

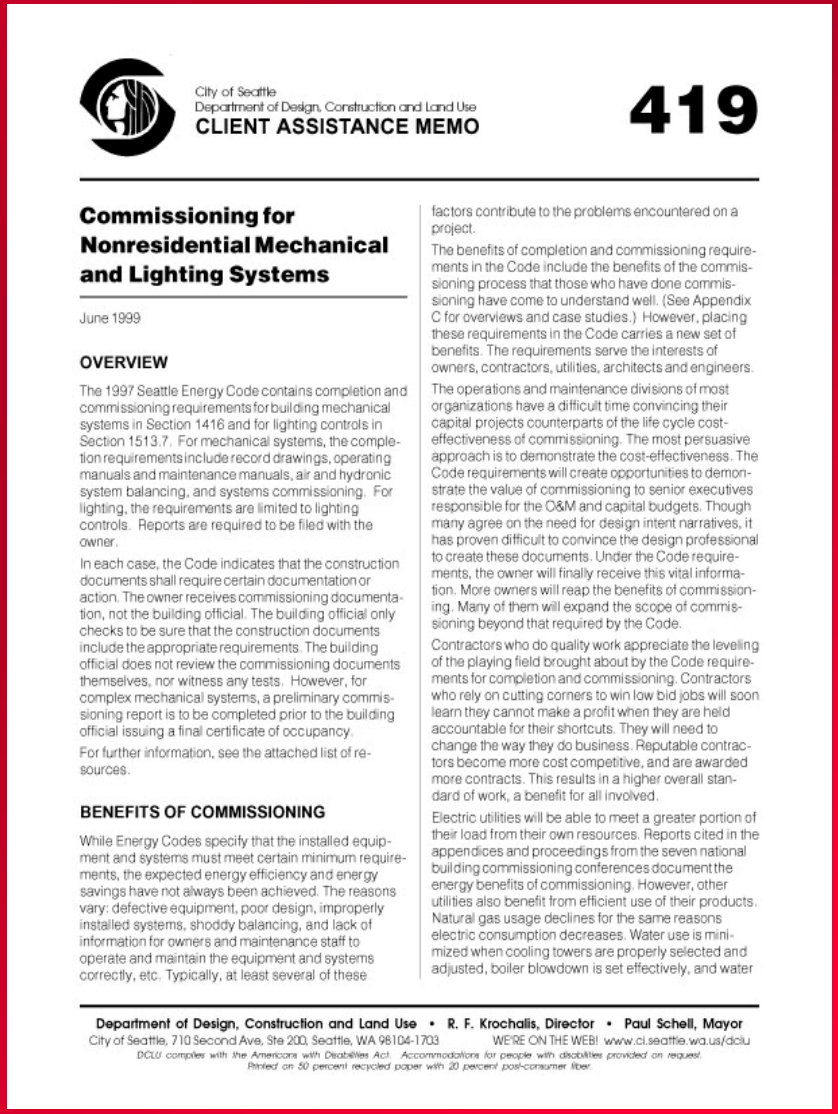
CODE LANGUAGE: Limitations

- Does not address full commissioning:
  this is a only a narrow slice of the process
  (does not included concept development, pre-design,...post-occupancy, etc.)
- Does not specify who does the work:
  owner decides whether to go 3rd party
- Does not require that the Building department witness the tests or verify that tests were done correctly

CODE IMPLEMENTATION: Public Information

- Public info documents:
  CAM #419
  - summarizes benefits of commissioning
  - list resources, and
  - provides sample text for plans in App.G

  (available on the web)



City of Seattle
Department of Design, Construction and Land Use
CLIENT ASSISTANCE MEMO

419

Commissioning for Nonresidential Mechanical and Lighting Systems

June 1999

OVERVIEW

The 1997 Seattle Energy Code contains completion and commissioning requirements for building mechanical systems in Section 1416 and for lighting controls in Section 1513.7. For mechanical systems, the completion requirements include record drawings, operating manuals and maintenance manuals, air and hydronic system balancing, and systems commissioning. For lighting, the requirements are limited to lighting controls. Reports are required to be filed with the owner.

In each case, the Code indicates that the construction documents shall require certain documentation or action. The owner receives commissioning documentation, not the building official. The building official only checks to be sure that the construction documents include the appropriate requirements. The building official does not review the commissioning documents themselves, nor witness any tests. However, for complex mechanical systems, a preliminary commissioning report is to be completed prior to the building official issuing a final certificate of occupancy.

For further information, see the attached list of resources.

BENEFITS OF COMMISSIONING

While Energy Codes specify that the installed equipment and systems must meet certain minimum requirements, the expected energy efficiency and energy savings have not always been achieved. The reasons vary: defective equipment, poor design, improperly installed systems, shoddy balancing, and lack of information for owners and maintenance staff to operate and maintain the equipment and systems correctly, etc. Typically, at least several of these factors contribute to the problems encountered on a project.

The benefits of completion and commissioning requirements in the Code include the benefits of the commissioning process that those who have done commissioning have come to understand well. (See Appendix C for overviews and case studies.) However, placing these requirements in the Code carries a new set of benefits. The requirements serve the interests of owners, contractors, utilities, architects and engineers.

The operations and maintenance divisions of most organizations have a difficult time convincing their capital projects counterparts of the life cycle cost-effectiveness of commissioning. The most persuasive approach is to demonstrate the cost-effectiveness. The Code requirements will create opportunities to demonstrate the value of commissioning to senior executives responsible for the O&M and capital budgets. Though many agree on the need for design intent narratives, it has proven difficult to convince the design professional to create these documents. Under the Code requirements, the owner will finally receive this vital information. More owners will reap the benefits of commissioning. Many of them will expand the scope of commissioning beyond that required by the Code.

Contractors who do quality work appreciate the leveling of the playing field brought about by the Code requirements for completion and commissioning. Contractors who rely on cutting corners to win low bid jobs will soon learn they cannot make a profit when they are held accountable for their shortcuts. They will need to change the way they do business. Reputable contractors become more cost competitive, and are awarded more contracts. This results in a higher overall standard of work, a benefit for all involved.

Electric utilities will be able to meet a greater portion of their load from their own resources. Reports cited in the appendices and proceedings from the seven national building commissioning conferences document the energy benefits of commissioning. However, other utilities also benefit from efficient use of their products. Natural gas usage declines for the same reasons electric consumption decreases. Water use is minimized when cooling towers are properly selected and adjusted, boiler blowdown is set effectively, and water

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CODE IMPLEMENTATION: Energy Code Training

- Timing for training on Energy Code revisions:
  - sessions 1-2 months prior to effective date *(for those working on upcoming projects)*
  - AND 3-6 months after effective date *(after people realize that revisions are in effect)*
- Training personnel:
  - involve plan review and inspection staff *(ensures that staff understand the code, AND draws audience who want to ask questions on what is expected for plan review/inspections)*

CODE IMPLEMENTATION: Plan Review

- Must do plan review for Energy Code compliance:
  - Seattle does not accept architect or engineer's stamp in lieu of plan review
  - 5 staff do Energy Code & Mechanical Code plan review for all nonresidential and R-1 occupancy

  (+ 16 plans reviewers check structural & R-3)
- Check that completion notes are on the drawings:
  - notes in specifications alone not acceptable
  - plans examiners put stickyback note on drawings (if completion requirements are not noted)

CODE IMPLEMENTATION: Inspection

- Must do inspection for Energy Code compliance:
  - 3 mechanical inspectors check HVAC systems to Energy Code & Mechanical Code requirements *(+ building (9), electrical (9), boiler, plumbing)*
- Inspection for completion & commissioning:
  - not checking for record drawings
  - manuals already required by Mechanical Code
  - checking for copy of balancing report
  - checking for preliminary commissioning report

LESSONS LEARNED

- <u>Contractor response to code requirements:</u>
  - commissioning is a higher priority
  - 80% know they need the reports *(all the locals)*
    but majority still need reminding
  - must don't mind as long as they know in advance
- <u>Issues raised by mechanical inspectors:</u>
  - some people still don't understand why we do it,
    the benefits and where commissioning fits in
  - need to provide format/min.req'ments for reports
  - challenge with floor-by-floor completion
  - should commissioning be done by 3rd party?

RESOURCES

- Code language: Seattle Energy Code website *(www.ci.seattle.wa.us/dclu/energy, Chap. 14 - Sec. 1416; Chap. 15 - Sec. 1513.7)*
- DCLU public information documents:
  Client Assistance Memo #419
  (www.ci.seattle.wa.us/dclu/energy/cam)
- DCLU staff:
  John Hogan (adoption & intent): 206-386-9145
  Energy/Mechanical plan review: 206-684-7846